

1. A method of restoring reduced or absent blood flow capacity to an artery in a patient, comprising the steps of:

excavating plaque and the like from within a segment of an artery;

placing a vascular graft at a location within and as an internal lining for the artery at least co-extensive with the excavated segment;

securing the vascular graft within said artery at said location.

2. A method according to Claim 1 comprising the step of surgically accessing the artery prior to the excavating step.

3. A method according to Claim 2 comprising the step of surgically closing the artery access following the securing step.

4. A method according to Claim 2 wherein the accessing step comprises performing an arteriotomy.

5. A method according to Claim 2 wherein the accessing step comprises percutaneously using a needle.

6. A method according to Claim 1 wherein the excavating step comprises passing a guide wire through the segment of the artery.

7. A method according to Claim 6 wherein the passing step comprises advancing a dynamic wire guide into the plaque region to assist passage of the guide wire.

8. A method according to Claim 1 wherein the excavating step comprises initially loosening the plaque from artery.

9. A method according to Claim 8 wherein the loosening step comprises engaging the plaque with a dynamic disrupter.

10. A method according to Claim 8 wherein the loosening step comprises using a dynamic wire guide.

11. A method according to Claim 1 wherein the excavating step comprises performing an endarterectomy.

12. A method according to Claim 11 wherein the performing step comprises using an endarterotome.

13. A method according to Claim 11 wherein the performing step comprises using an atherotome.

14. A method according to Claim 11 wherein the performing step comprises using a Hall loop.

15. A method according to Claim 11 wherein the performing step comprises using a ring dissector.

16. A method according to Claim 11 wherein the performing step comprises using a Scanlan Endarsector.

17. A method according to Claim 11 wherein the performing step comprises using an arterial stripper.

18. A method according to Claim 2 wherein the excavating step comprises separating pieces of atheromatous and arterial material from other arterial material along an interface of weakness and pulling the pieces from the artery through the site of surgical access.

19. A method according to Claim 18 wherein the separating step comprises grasping at least one piece of atheromatous and arterial material and pulling thereon causing the piece to separate from the artery along a natural interface of weakness.

20. A method according to Claim 18 wherein the separating step comprises bluntly dissecting along the natural interface of weakness.

21. A method according to Claim 1 wherein the excavating step comprises performing an atherectomy.

22. A method according to Claim 21 wherein the performing step comprises using an atherotome.

23. A method according to Claim 21 wherein the performing step comprises using a Hall loop.

24. A method according to Claim 21 wherein the performing step comprises using a ring dissector.

25. A method according to Claim 21 wherein the performing step comprises using a Scanlan Endarsector.

26. A method according to Claim 21 wherein the performing step comprises using an arterial stripper.

27. A method according to Claim 1 wherein the excavating step comprises performing balloon angioplasty.

28. A method according to Claim 1 wherein the excavating step comprises performing laser atherectomy or angioplasty.

29. A method according to Claim 1 wherein the excavating step comprises performing ultrasound angioplasty.

30. A method according to Claim 1 wherein the excavating step comprises dilating the artery with a vessel dilator.

31. A method according to Claim 2 wherein the placing step comprises displacing the vascular graft through the surgical access site.

32. A method according to Claim 31 wherein the displacing step comprises using a forceps to grasp a distal end of the vascular graft.

33. A method according to Claim 1 wherein the placing step comprises using a balloon catheter to hold a distal end of the vascular graft by inflating the balloon inside the distal end of the vascular graft.

34. A method according to Claim 1 wherein the placing step comprises suturing a distal end of the vascular graft to a mandrel, advancing the mandrel and the vascular graft collectively into the artery, unsuturing the vascular graft from the mandrel and removing the mandrel from the artery.

35. A method according to Claim 1 wherein the placing step comprises holding the distal end of the vascular graft using a placer/suturer, pushing the vascular graft and placer/suturer concurrently into the artery, connecting the distal end of the vascular graft to the artery and removing the placer/suturer.

36. A method according to Claim 35 wherein the connecting step comprises suturing.

37. A method according to Claim 35 wherein the connecting step comprises stapling.

38. A method according to Claim 1 wherein the placing step comprises connecting a distal end of the vascular graft, a stent and a distal end of a catheter and jointly advancing the vascular graft, the stent and the catheter into the artery.

39. A method according to Claim 1 wherein the placing step comprises advancing a stent into the artery.

40. A method according to Claim 1 wherein the placing step comprises applying a coating to the excavated arterial segment.

41. A method according to Claim 1 wherein the placing step comprises inserting a sheath into the artery, advancing the vascular graft through the sheath into the artery and removing the sheath from the artery.

42. A method according to Claim 1 wherein the placing step comprises radially expanding the vascular graft while at the excavated segment of the artery.

43. A method according to Claim 42 wherein the expanding step comprises expanding a balloon inside the graft one or more times.

44. A method according to Claim 42 wherein the expanding step comprises mechanically spreading the vascular graft.

45. A method according to Claim 1 wherein the securing step comprises attaching the vascular graft to the artery by suturing.

46. A method according to Claim 1 wherein the securing step comprises attaching the vascular graft to the artery by suturing only at a proximal end of the vascular graft, leaving the distal end of the vascular graft unattached but dilated at least in part by arterial pressure.

47. A method according to Claim 1 wherein the securing step comprises attaching the vascular graft to the artery by suturing only at a proximal end of the vascular graft and by tissue in-growth, accomplished over a protracted period of time throughout the length including a distal end of the vascular graft.

48. A method according to Claim 1 wherein the securing step comprises attaching the vascular graft to the artery by stapling.

49. A method according to Claim 1 wherein the securing step comprises only attaching the vascular graft to the artery by stapling the proximal end of the vascular graft to the artery.

50. A method according to Claim 1 wherein the securing step comprises holding the vascular graft in the arterial segment by expanding at least one stent inside the vascular graft.

51. A method according to Claim 1 wherein the securing step comprises holding the vascular graft in the arterial segment by expanding at least one stent within a proximal portion of the vascular graft only.

52. A method according to Claim 1 wherein the securing step comprises independently placing the vascular graft and at least one stent within the arterial segment followed by expanding the stent inside the vascular graft.

53. A method according to Claim 1 wherein the securing step comprises connecting at least one unexpanded stent to the vascular graft, jointly inserting the connected stent and vascular graft into the artery followed by expanding the stent in respect to the vascular graft.

54. A method according to Claim 1 wherein the securing step comprises suturing the vascular graft to the artery at both proximal and distal ends thereof, access for suturing being via spaced arteriotomies.

55. A method according to Claim 1 wherein the securing step comprises stapling the vascular graft to the artery at both proximal and distal ends thereof, access for stapling being via spaced arteriotomies.

56. A method according to Claim 1 wherein the securing step comprises suturing one end of the vascular graft to the artery and holding the other end of the vascular graft against the artery by expanding an internal stent.

57. A method according to Claim 56 wherein suturing takes place at the proximal end of the vascular graft.

58. A method according to Claim 1 wherein the securing step comprises stapling one end of the vascular graft to the artery and holding the other end of the vascular graft against the artery by expanding an internal stent.

59. A method according to Claim 58 wherein stapling takes place at the proximal end of the vascular graft.

60. A method according to Claim 1 wherein the securing step comprises expanding a stent within the vascular graft at each of the proximal and distal ends of the vascular graft.

61. A method according to Claim 60 wherein the vascular graft and the stents are separately advanced into the artery.

62. A method according to Claim 60 wherein the vascular graft and the stents are connected and then advanced into the artery.

63. A method according to Claim 62 wherein the stents are connected to the outside of the vascular graft.

64. A method of restoring lost blood flow capacity to an artery of a medical patient, comprising the steps of:

enlarging the flow path size of a plaque-ridden segment of an artery;

placing a vascular lining within the artery at least in part co-extensive with a portion of the segment;

securing the vascular graft within said artery at said location.

65. A method according to Claim 64 wherein the enlarging step comprises enlarging the flow path within the artery by performing an angioplasty.

66. A method according to Claim 64 wherein the enlarging step comprises loosening plaque.

67. A method according to Claim 64 wherein the enlarging step comprises cutting plaque.

68. A method according to Claim 64 wherein the enlarging step comprises chipping plaque.

69. A method according to Claim 64 wherein the enlarging step comprises grinding plaque.

70. A method according to Claim 64 wherein the enlarging step comprises applying laser energy to the plaque.

71. A method according to Claim 64 wherein the enlarging step comprises separating and removing both plaque and a portion of the interior of the artery.

72. A method according to Claim 64 wherein the enlarging step comprises applying ultrasound energy to the plaque.

73. A method according to Claim 64 wherein the enlarging step comprises excising pieces of plaque from the artery.

74. A method according to Claim 62 wherein the enlarging step comprises grasping and tearing pieces of plaque from the artery.

75. A method according to Claim 62 wherein the enlarging step comprises diametrically expanding the plaque-ridden segment of the artery.

76. A method of lining a vessel of a medical patient to alleviate reduced blood flow, comprising the steps of:

introducing a vascular graft material into the interior of a vessel;

placing the vascular graft material within the vessel at a predetermined arterial site;

causing adherence between the vascular graft material and the vessel at the site.

77. A method according to Claim 76 wherein the introducing step comprises advancing the vascular graft material through an incision.

78. A method according to Claim 76 wherein the placing step comprises coating the vessel with the vascular graft material.

79. A method according to Claim 77 further comprising surgically closing the incision after the causing step.

80. A method of lining a vessel of a medical patient, comprising the steps of:

enlarging the flow path size of a segment of a vessel;
placing a vascular lining at a location within the vessel at the segment;

securing the vascular lining to the inside of the vessel at said location.

81. A method of lining a vessel of a medical patient, comprising the steps of:

treating the flow path interior of a vessel;
placing a vascular lining at a location within the vessel at the segment;

securing the vascular graft to the inside of the vessel at said location.

82. A vascular graft disposed in a vessel comprising a generally cylindrically-shaped hollow member comprising an outside surface contiguous with the vessel, an inside surface defining a stenosis-resistant blood flow path lumen and at least one adherence site securing the cylindrically-shaped hollow member to the vessel.

83. A vascular graft according to Claim 82 wherein the outside surface of the generally cylindrically-shaped member is contiguous with the adventitia layer of an artery.

84. A vascular graft according to Claim 82 wherein the adherence site comprises at least one physical connection extending only through a proximal end of the generally cylindrically-shaped member into the vessel.

85. A vascular graft according to Claim 84 wherein the physical connections extend through both the proximal end and a distal end of the generally cylindrically-shaped member into the vessel.

86. A vascular graft according to Claim 82 further comprising at least one expanded stent disposed within the generally cylindrically-shaped member biasing the cylindrically-shaped member against the vessel.

87. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises a coating.

88. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises a tubular synthetic resinous member.

89. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises shape-retaining internal reinforcement.

90. A vascular graft according to Claim 89 wherein the tubular synthetic resinous member comprises a biologically inert fabric and a stiff, high density material.

91. A vascular graft according to Claim 88 wherein the tubular synthetic resinous member comprises a soft, low density material.

92. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises an annulus having a uniform inside bore.

93. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member is tapered.

94. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member is bifurcated.

95. A vascular graft according to Claim 89 wherein the reinforcement comprises at least one ring.

96. A vascular graft according to Claim 89 wherein the reinforcement comprises a spirally-shaped member.

97. A vascular graft according to Claim 82 further comprising at least one expandable stent connected to the generally cylindrically-shaped member.

98. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises at least in part a lumen taken from a human being.

99. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises at least in part a lumen taken from an animal.

100. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises tissue in-growth receiving material.

101. A vascular graft according to Claim 82 wherein the generally cylindrically-shaped member comprises a material diametrically expanded while in the vessel.

102. A vascular graft according to Claim 100 wherein the adherence runs the full length of the graft due to tissue in-growth.

103. A vascular graft according to Claim 102 wherein the blood flow path lumen inside the graft remains open and patent in all situations where the original vessel lumen would normally remain open and patent.

104. A vascular graft according to Claim 103 wherein the situations include situations that would tend to occlude vascular grafts placed in by-pass tissue tunnels.

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